

Comparability of Tendo Weightlifting Analyzer with Recreational and Explosive Bench Press Exercise

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PURPOSE: Previous research has reported valid (within 15%) measurement of power during bench press exercise using Tendo weightlifting analyzers. However, the accuracy of power measurements of the Tendo has not been evaluated when different concentric contractions were used. The purpose of this study was to examine the comparability of the Tendo™ Sports Weightlifting Analyzer during bench press exercise using recreational and explosive concentric contractions. **METHODS:** 12 college-aged males with moderate bench press experience performed 1RM bench press, two familiarizations, and 4 experimental protocols using 30% of 1-RM with recreational (30REC) and explosive concentric muscle actions (30EXPL), and 50% of 1-RM (50REC and 50EXPL) on two different days with at least 48hrs between days. Each testing session required subjects to perform two sets of three repetitions of bench press with 2min rests. The barbell was fitted with the Tendo unit to measure the average power of each repetition. Each subject's eccentric ranges of motion were standardized with a metal bar fixed at chest level. When the barbell was lowered to the metal bar, the subject was instructed to raise the load using either recreational (neither explosive nor slow) or maximally explosive concentric muscle actions. To compare with the Tendo Weightlifting Analyzer, a pressure sensitive touch-pad activated Brower timing system initiated each rep at the bottom of the range of motion, and suspended lasers ended the time for each rep at the top. The time to complete each rep was used with the load (kg) and the barbell distance to calculate avg power (W) for comparison with the Tendo results. **RESULTS:** Paired T tests for each repetition showed significantly greater ($p < 0.05$) average power from the infrared timing system compared to the Tendo for 30REC (129.6 ± 55.8 and 127.7 ± 51.8 W, $p = 0.481$), 30EXPL (372.2 ± 125.6 and 334.0 ± 88.5 W, $p = 0.000$), 50REC (218.4 ± 82.9 and 205.9 ± 63.2 W, $p = 0.000$), and 50EXPL (456.5 ± 115.8 and 407.6 ± 90.9 W, $p = 0.000$). **CONCLUSION:** The Tendo Weightlifting Analyzer provided somewhat comparable average power measurements during both recreational bench press contractions and maximally explosive contractions (Average Difference= 16%, 14%, respectively).